

the students for business as farmers or for teaching and research.

Two more purely scientific papers were also taken on the first day; Dr. G. H. Carpenter described some of his work upon the warble-fly and its attacks, and Mr. H. Hunter explained the results of the long and systematic trials of barley varieties that have been made in Ireland by the cooperation of Messrs. Guinness with the Department of Agriculture. These trials have established beyond any doubt the general superiority of "Archer" to other barleys, both from the farmers' and the brewers' standpoint, thus confirming the results of the very similar trials made in Denmark.

Friday was given over to papers and discussions on breeding and on the light which science is beginning to throw on the problems of the stock raiser. Mr. Bateson opened the proceedings by a luminous exposition of the Mendelian standpoint, with illustrations of how the work of the raiser of new varieties of plants or the improver of breeds of animals could reduce his work to something like certainty, and work by design instead of by chance. Mr. W. Heape, F.R.S., who followed, pleaded for the establishment of experimental farms devoted to the solution of breeding problems; attention is at present exclusively given to the raising of crops, forgetting the enormous importance of our live-stock business. To Ireland such experimental work would be specially valuable. Mr. Punnett then gave an account of some of the more special applications of the Mendelian principles to stock questions, and Prof. J. Wilson showed how the facts of colour inheritance in cattle led to certain conclusions concerning the original races of cattle which have gone to make up the breeds now prevailing in the British Islands.

On the Monday the section resumed its previous economic point of view, and gave itself up to a very animated discussion of the factors which make for the success of small holdings. Mrs. Wilkins (Miss Jebb) opened the proceedings with a paper in which she sketched the very various conditions under which success had been achieved in England, and the necessity of certain collateral developments, such as cooperation, if any considerable numbers of small holders have to support themselves upon the land. She maintained that the fact that small tradespeople and mechanics rather than agricultural labourers are at the present moment chiefly applying for small holdings is really a good omen for the success of the movement, since such men are, as a rule, better able to make an economic use of the land than men who would be forced to depend wholly upon their small farming.

Mr. Christopher Turnor insisted on the importance of guiding the small holder in his methods of work and cropping, even to the extent of establishing in each district one or two model holdings cultivated for demonstration purposes. Mr. F. Impey gave some account of the work that had been done in Great Britain in obtaining small holdings of recent years, and Mr. Beach Thomas described the evidence he had received as to the widespread desire of city workers to get back to the land. An animated discussion followed, a little political, perhaps, at times, and not wholly devoid of rhetorical heat, but still informing; the general impression which seemed to emerge was that success is being attained by market gardening and fruit growing rather than by small farming. The president showed that in many cases, especially in Ireland, it is the community rather than the individual who should be the small holder, thus automatically ensuring cooperation both in the work and the trading.

The last meeting was held jointly with the parent section of economics to hear various papers of a more general economic character. Dr. Graham Brooks discussed the moral effects of cooperation upon the workers, and Dr. Moritz Bonn, of Munich, examined the statistics relative to Irish agriculture to ascertain if the last twenty years of land reform had begun to effect any improvement in the productive power of the Irish occupier. Statistically he could detect but little change, a view for which he was somewhat fiercely taken to task by the politicians present. Statistical papers by Prof. J. Wilson and Mr. W. G. Adams terminated a very successful session of the subsection, at which the interest and attendance had been maintained from the first day until the last.

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METEOROLOGY IN AUSTRALIA.¹

THE Commonwealth Bureau of Meteorology, Australia has now been in existence more than a year, and issued its first Bulletin a few months ago. This is an article on the "Climate and Meteorology of Australia," and is written by the Commonwealth meteorologist, Mr. H. A. Hunt. It contains some very interesting data with regard to the climate of the various capitals, and indicates that Adelaide is the driest and sunniest, and that Brisbane is the hottest, capital. The hottest region is in the northern part of West Australia, near the Marble Bar and Nullagine goldfields, where the maximum shade temperature often exceeds 100° for days and even weeks continuously.

The Northern Territory and Queensland receive their rain in the summer from the monsoonal depressions from the north-east. The southern parts of West Australia and South Australia benefit from the Antarctic depressions in winter. In Victoria and Tasmania the seasonal change of rainfall is not strongly marked. New South Wales gets most of its rain in the later summer and autumn.

The wettest place is Geraldton, in north-east Queensland, with an average yearly fall of 145 inches; the driest region is round Lake Eyre, where 10 inches in one year is exceptional, 5 inches being the average.

In discussing cyclones and storms, mention is made of the "Willy Willies" which afflict the north-west parts of West Australia. These are severe cyclones which apparently originate in the Cambridge Gulf and travel south-west and south along the line of the coast, or they cross the continent towards the Australian Bight. These storms cause great havoc, and are marked by torrential rains.

The "Southerly Burster" is peculiar to the eastern parts of Australia, and is a cold wind which always follows a period of hot weather. It is usually associated with the V-shaped depression between two anticyclones. These storms are usually first noted on the extreme south coast, and they travel northward at the rate of about twenty miles per hour. The velocity of the winds varies, sometimes reaching eighty miles per hour.

Winds of similar character to "Busters" are the "Bora" on the east coast of the Adriatic, the "Mistral" in France, the "Northers" of Texas, and the "Pampero" in the Argentine. South Africa also has a wind of like nature and origin.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—On the occasion of the visit of the members of the International Conference on Electrical Units, the Public Orator (Dr. Sandys) spoke as follows in presenting on October 17 the several distinguished recipients of the degree of Doctor of Science *honoris causa* :—

(1) Scandinauiam hodie nobis quasi praesentem reddit Upsalae et Holmiae alumnus insignis, qui "electrolysis" (ut aiunt) praesertim in provincia investigatorum omnium dux et signifer merito existimatur; qui scientiae chemicae in regione physica inter conditores praecipuos numeratur; qui e scientia illa praemium orbi terrarum toti propositum reportavit, cuius laudis inter participes illustres et Cancellarium nostrum et rei physicae Professorem nostrum esse gloriamur. Idem solis ipsius naturae inter exploratores patientissimus, tempestatum inter augures perspicacissimus, (ut Aristophanis verbis paullulum mutatis utar) τῶν νῦν μετεωρολογούντων quasi princeps iure optimo esse fertur.

Ergo Scientiarum Doctor hodie merito creatur scientiae chemicae in provincia physica Instituti Nobilis Scientiarum in Academia Regia Holmensi Rector, SVANTIUS AUGUSTUS ARRHENIUS.

(2) Francogallorum respublica maxima, nobis vicina, nobis amicitiae vinculis indies artioribus coniuncta, viri desideratissimi in vicem, successorem eius misit dignissimum, qui non modo inter Germanos sed etiam inter Francogallos educatus, Parisiensium in Universitate iam per annos duo et viginti scientiam physicam praeclare

¹ "The Climate and Meteorology of Australia" (Reprinted from the "Year Book of the Commonwealth of Australia." Bulletin No. 1, issued March, 1908.) By H. A. Hunt.

professus est. Rerum Naturae quidem studiosis non ignotum est electrometron illud ab eodem inventum. Etiam plurimum oculis obversatae sunt imagines illae pulcherrimae in quibus lucis auxilio et colores varii et luminis ipsius spectrum (ut aiunt) accuratissime redduntur. Peritoribus autem nota sunt volumina, quae ab eo et audiendi et videndi rationi universae explicandae dedicata sunt, quae et vim caloris et vim electricam modulosque eius ordine lucido enuclearunt. In his modulis sollertissime metiendis, iuvat recordari Cancellarii nostri cum rationibus hospitis nostri hodierni rationes minutissime quadrare. Ceterum de re tam subtili non nostrum est hodie fusius disputare; oratoris vestri ex animo nondum excidit monitum illud Horatianum:—

“metiri se quemque suo modulo ac pede verum est.”

Praesento vobis Francogallorum Instituti socium illustrem, GABRIELEM LIPPMANN.

(3) Etiam e republica maxima trans aequor Atlanticum, nobis coniunctissima, ad nos advectus est vir insignis, Washingtonii in urbe illustri mensurae et ponderis provinciae praepositus, qui pecuniae publicae summam ingentem sibi liberaliter creditam, et scientiae ipsius et populi industrii maximo cum fructu, his rebus omnibus ad normam accuratam redigendis dedicavit; qui quantum operariorum industriae scientiarum exquisita cognitio conferat, luculenter demonstravit. Non inter antiquos tantum sed etiam nostro in saeculo trans aequor Atlanticum cognitum est, Mercurio, Atlantis nepoti, negotiariorum omnium numini, Divam Minervam, scientiarum omnium reginam, sororem esse omnium dignissimam. Animi nostri frater in testimonium, eo libentius hodie salutamus virum eloquentem, quem etiam ipsum Atlantis nepotem facundum nominaverim, SAMUELEM WESLEY STRATTON.

(4) Olim Altonae natus, a Berolinensibus educatus et ab eisdem scientiae physicae ad cathedram revocatus, adest sonitus in aëre clausi velocitatis investigator clarissimus, qui itineris sui inter comites insigniores etiam Cancellarium nostrum numeravit. Idem rei magneticae phaenomena illa perquam impedita expedit, quae Professor quidam noster postea *Hysteresis* nomine nuncupavit. Denique scientiae physicae Imperii totius Germanici Instituto celeberrimo praepositus, virorum magnorum successor magnus merito esse existimatur. Inter Doctores nostros honoris causa olim HELMHOLTZII numeravimus: hodie successorem eius recentissimum ordini eidem libenter addimus.

Doctorem nostrorum seriem claudit hodie scientiae physicae honoris causa Professor Berolinensis, AEMILIUS WARBURG.

A large number of specimens of timber, grown, many under forestry conditions, on the Brocklesby Estate, Lincolnshire, has recently been sent by Lord Yarborough to the forestry museum, which is temporarily housed in the botany school. No fewer than seventy-seven species of trees are represented in this donation. Although forestry, as a subject of instruction at Cambridge, only dates from October, 1907, the collection of timbers already acquired is considerable, and includes both home-grown and foreign specimens, some of which are extremely rare, as that of the Servian spruce, an almost extinct species, which is confined to the valley of the Drina, between Servia and Bosnia.

The Gedge prize has been awarded to E. Mellanby, of Emmanuel College, for his essay entitled “Creatin and Creatinin.”

Prof. Pope announces a valuable gift of apparatus and chemicals which has been made to the university chemical laboratory by the master and fellows of Gonville and Caius College and the master and fellows of Sidney Sussex College upon the closing of the chemical laboratories in the two colleges.

A CONFERENCE of fruit-growers will be held at the South-Eastern Agricultural College, Wye, Kent, on November 27, under the chairmanship of Mr. C. W. Radcliffe Cooke, president of the National Association of English Cider-makers. Insecticides will be discussed by Mr. Spencer Pickering, F.R.S., spraying and spraying machinery by Mr. E. S. Salmon, grading and packing by a representative from British Columbia.

SOME two years ago the governors of the Sir John Cass Institute decided, in view of the great importance of the fermentation industries and the fact that there was very little methodical instruction available in London for those who were occupied in breweries and distilleries, to institute a course upon the chemistry of fermentation, and they appointed Mr. Arthur R. Ling to conduct this course. They have now broadened the basis of the work; and over and above the laboratory course in brewing and malting Dr. A. Harden will, during the winter, give a course of instruction in the micro-biology of the fermentation industries, which will consist of lectures and demonstrations. The first of this course was delivered on October 6, when Dr. Horace Brown, F.R.S., occupied the chair. In his opening remarks the chairman alluded to the value of scientific research, and said that there appears to be a considerable amount of misconception in the lay mind as to the meaning of the treatment of scientific research, and perhaps a still greater misconception in the methods employed in furthering it. The popular belief at present in vogue is that the scientific worker, in the first place, looks round for some great problem which calls for solution, and then proceeds by a series of experiments of trial and error to cut deep into the heart of the subject. Occasionally this method, if carried out, may lead to results, but he would rather suggest that research consists in finding some loose thread in the frayed edge of a piece of embroidery and in patiently following up the slender clue wheresoever it may lead, thus gradually revealing the elaborate pattern and the manner in which it is interwoven. Dr. Harden in his lecture first traced the history of the progress of knowledge with regard to alcoholic fermentation, referring to the work of Lavoisier, Liebig, Pasteur, and Buchner. Working with Mr. Young at the Lister Institute, he found that phosphates gradually increase the rate of fermentation, a definite chemical reaction taking place in which the amount of carbonic acid exactly equivalent to the phosphate added is evolved, the phosphate itself entering into combination with the second molecule of sugar. Finally, a short account was given of recent work on the fermenting complex present in yeast-juice. Dr. Harden and Mr. Young consider this to consist of two distinct substances—the enzyme and co-enzyme—the cooperation of which is necessary to produce fermentation when added to a solution of sugar and a phosphate.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 4.—“Note on a New Sounding Machine for use on Lakes and Rivers without a Boat. By Prof. E. J. Garwood. Communicated by Prof. T. G. Bonney, F.R.S.

The sounding machine was designed specially for use on mountain lakes and rivers where boats cannot be obtained, but it can also be used with a boat, in which case it has the advantage over the sounding machines usually employed, since it registers the position as well as the depth of each sounding.

The instrument consists of two posts which are erected on opposite sides of a lake or river; between them a line is stretched, the ends of which are wound on drums carried by the posts. By alternately winding this line on each post a float is drawn backwards and forwards across the lake, the position of the float at any moment being automatically registered on the post worked by the observer. The float carries a pulley over which the plummet line travels, the end of this line being wound on a second drum attached to the observer's post. In this way rows of soundings can be taken across the lake, one of the posts being moved each time that the float reaches the shore until the whole lake has been charted.

By a mechanical device one counting machine is made to register both the depth of each sounding and the distance from the shore at which it is taken; it is also engraved with a double set of figures counting in opposite directions, so that observations can be taken in whichever direction the float is travelling. The instrument is supplied with a check and also a stop brake, and mechanical devices are provided to insure the constant tension of the line, and for preventing unequal piling of the line on the two drums.